REMARKS

Claim status

Claims 1-70 were pending in the case at the time of the current Office Action. Claims 11-38 and 47-70 have previously been withdrawn. Claims 1-70 are currently pending in the application.

Specification rejections

In the current Office action, the Examiner has reminded the Applicant of the proper language and format for the ABSTRACT of the specification.

Applicants have amended the ABSTRACT herein to comply with the Examiner's suggestion..

Section 102 rejections

In the current Office action, claims 1, 2, 42, and 44 are rejected under 35 U.S.C. 102(b) as being anticipated by Fujita et al. (U.S. Patent 5,825,336).

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

Independent claim 1 recites an apparatus for image data computation and for synchronous image data output, comprising:

an external input unit;

at least one signal input which can be connected thereto;

a first message channel;

a graphics master unit which has a first random access memory adapted to receive a first scene graphics data file which defines objects and/or events which can be illustrated in an image and associates object and event parameter values respectively with the objects and/or events, is connected to the signal input, is connected by way of a first message interface for incoming and outgoing messages to the first message channel and which is adapted to re-compute and store the

object and/or event parameter values of the first scene graphics data file in dependence on the current object and/or event parameter values thereof and the current state of the signal input and to produce and send a first message by way of the first message interface, wherein the first message contains at least a part of the freshly computed object and/or event parameter values; and

at least two graphics client units, wherein each graphics client unit has a respective second random access memory which is adapted to receive a second scene graphics data file, is connected by way of a second message interface for incoming and outgoing messages to the first message channel, has an image data output, and is adapted to receive current object and/or event parameter values by way of the second message interface and to store the received object and/or event parameter values in the second scene graphics data file, to compute image data of an image in dependence on current object and/or event parameter values of the second scene graphics data file, to produce and send a second message to the graphics master unit by way of the second message interface which signals the conclusion of the image data computation of the image, and to output the image data at the image data output.

It is respectfully submitted that Fujita et al. (U.S. Pat. No. 5,825,336), hereinafter Fujita, does not teach or suggest the invention of independent claim 1. In particular, Fujita does not teach or suggest a graphics master unit adapted to receive a first scene graphics data file which defines objects and/or events. Also, Fujita does not teach or suggest at least two graphics client units adapted to receive a second scene graphics data file. In fact, Fujita does not talk about and is not concerned with scene graphics data files at all as used in the claimed invention of claim 1 and as described in the present application.

On pages 15 to 17 of the current Office action, the Examiner explains in section 9 that, according to his broad interpretation of Fujita, a transmission and processing of scene graphics data files is described. Applicants believe that this is an error in fact. The Examiner seems to overlook the fact that the term "scene graph file" is a well-defined technical term in the art of three-dimensional image processing and that the term "scene graphics data file" is an equivalent term as used and described in the current application and claims. Referring to the article for the

term "scene graph" under www.wikipedia.org, the article says, "A scene-graph is a general data structure commonly used by vector-based graphics editing applications and modern computer games. Examples of such programs include AutoCAD, Adobe Illustrator and CorelDraw. The scene-graph is an object-oriented structure that arranges the logical and often (but not necessarily) spatial representation of a graphical scene." The article goes on to say, "Scene-graphs are a collection of nodes in a graph or tree-structure. This means that a node may have many children but often only a single parent, the effect of a parent is apparent to all its child notes – An operation applied to a group automatically propagates its effects to all of its members. In many programs, associating a geometrical transformation matrix at each group level and concatenating such matrices together is an efficient and natural way to process such operations. A common feature, for instance, is the ability to group related shapes/objects into a compound object which can then be moved, transformed, selected, etc. as easily as a single object."

Furthermore, paragraph [0016] of the present application states, "The graphics master unit has a first random access memory in which a first scene graphics data file is stored. The term scene graphics data file is used to denote a file with definitions of objects and/or events which can be illustrated in an image and in which object or event parameter values are associated with the objects and/or events. Scene graphics data files can be produced in different file formats, for example VRML, X3D, Inventor or Performer. The random access memory can be for example in the form of an RAM module in order to be able to carry out the writing and reading processes particularly quickly."

Therefore, from the foregoing, it can be seen that it is not true that conventional video data, as described in Fujita, can be equated with a scene graph file, as the Examiner seems to be trying to do. The Examiner's equating of conventional video data with a scene graph file is an error in fact. Therefore, based on the foregoing, it should be clear that Fujita is not concerned at all with scene graphic data files or the processing and use thereof, as is the claimed invention of claim 1.

Furthermore, Fujita is not concerned with the synchronized output of image data. In fact, a full text search in the USPTO data base reveals that the word "synchronize" is not even mentioned in Fujita. According to column 7, lines 53-56 of Fujita, the video data is transmitted

at a frequency of one frame per ten seconds. This low frequency clearly suggests that Fujita is not at all concerned with synchronized image data output. It is a clear misinterpretation of the terms used in the claims if the Examiner thinks that synchronizing between master and slave terminals is inherently disclosed by Fujita and is at all related to the claimed invention of claim 1. In view of a transmission rate of video data with a frequency of one frame per ten seconds (see column 7, lines 53-56 of Fujita) it should be clear that the teaching of Fujita has nothing to do with the calculation and rendering of scene graph files, which are used for real-time three-dimensional image calculation.

Instead, Fujita focuses on controlling remote video slave display terminals from a single master display terminal. Fujita is directed to an operator making video parameter changes while looking at current video on a display of the master display terminal (e.g., changes to display positions, displayed text, etc.) and sends these changes to the slave display terminal. The slave display terminal takes the updated video parameters and forms an updated video based on the changes (e.g., repositioning displayed items on the display based on the operator changes). The updated video is sent back to the master display terminal so the operator can see the effect of his changes and know that what he sees is what is being displayed at the slave display terminal. The device of Fujita serves for a remote operation and control of a first computer ("client") from a remote second computer ("master"). A system comparable to that disclosed by Fujita is, for example, provided by the software product "PC Anywhere". In such a system, it is obligatory that the image data of the client are also present at the master, which remotely controls the client.

In the present invention of claim 1, there is a graphics master unit and at least two graphics client units. A scene graphics data file defines objects and events with object and event parameter values to form a file definition of a three-dimensional scene. Fujita does not teach or suggest any such scene graphics data file. In the present invention, the object and event parameter values are updated by the graphics master unit based on input changes and other event changes that occur. The changes are sent to the graphics client units where the graphics client units update their scene graphics data files with the updated parameter values for the objects and events and then create partial images for left eye and right eye 3-D viewing. The entire process is synchronized such that all graphics client units receive the updated message with the updated

parameters at the same time and then begin their individual image computation procedures so they can project their updated partial images at the same time. Also, the present invention of claim 1 does not imply any transmission of video data from the clients back to the master. The invention of claim 1, instead, provides a synchronous output of image data by the client units, especially in the process of real-time calculation and representation of three-dimensional scenes.

Instead, Fujita is concerned with updating display parameters to control how something looks on a remote slave display terminal. The control is being done by an operator at a master display terminal.

The current invention is concerned with updating scene graphic data files and for transmitting updated parameters for the scene graphic data files from the graphics master unit to the graphics client units such that these partial images, which are used to project a 3-D image, can be updated in a synchronized manner. The graphic client units do not transmit back any video image for an operator of the graphics master unit to view. The graphics master unit and the graphics client units are able to independently generate and update their own graphic output data based on the parameters that are updated by the graphics master unit. After the graphics master unit has computed the image of the scene graphics, the scene graphics data file includes the current parameter values of the scene. With an update message, the graphics master unit notifies all graphics client units of the current values of the scene graphics data file for the frames previously computed thereby, which the graphics client units require in order to compute their next respective partial image for that respective eye.

Fujita is simply concerned with remotely controlling the display of video based on certain display parameters and has nothing to do with scene graphics data files or updating object and event parameter values of those scene graphics data files. The only similarity between Fujita and the current invention of claim 1 is that there is, in both cases, a master/slave type of relationship. However, the type of data that is being updated and transferred back and forth between the master and the slave (client) are totally different and are for totally different purposes as should be clear based on the foregoing herein.

The Examiner states that Fujita discloses the master terminal comprising a random access memory and a data receiving portion for receiving video data transmitted from a slave terminal.

Applicant respectfully wishes to clarify to the Examiner that there is no transfer of video data from the client units to the master unit in the invention of claim 1. Instead, client units only send a second message to the master unit, indicating the conclusion of image data computation. Only a first message channel is used for communication between the master and client units. The image data are output at a specific image data output, which is local to each client unit. In contrast, the Examiner correctly states that, in Fujita, the slave terminals transmit video data back to the master terminal, which is interpreted by the Examiner to comprise some sort of completion signal to end communication. However, the invention of claim 1 strictly separates the transmission of the completion signal (first message channel) and the output of video data (image data output). The master unit of the apparatus of claim 1 does not need any video data from the client units because it is only the client units that generate and output image data for display.

Therefore, in view of at least the foregoing, it is respectfully submitted that independent claim 1 is not anticipated by Fujita, and it is respectfully submitted that independent claim 1 defines allowable subject matter. Also, since claims 2, 42, and 44 depend either directly or indirectly from claim 1, it is respectfully submitted that claims 2, 42, and 44 define allowable subject matter as well. Applicants respectfully request that the rejection of claims 1, 2, 42, and 44 under 35 U.S.C. 102(b) be removed.

Section 103 rejections

In the current Office action, claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita.

Applicants respectfully traverse the foregoing rejection in view of the above pending claims and for reasons set forth hereafter.

As described previously, Fujita does not teach or suggest the invention of independent claim 1 and it was submitted that claim 1 defines allowable subject matter. Since claim 43 depends either directly or indirectly from claim 1, it is respectfully submitted that claim 43 defines allowable subject matter as well. Applicants respectfully request that the rejection of claim 43 under 35 U.S.C. 103(a) be removed.

Also, in the current Office action, claims 3, 4, 39, 40, 45, and 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita in view of Ishiwata et al. (U.S. Patent 5,894,312), hereinafter, Ishiwata.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

As described previously, Fujita does not teach or suggest the invention of independent claim 1 and it was submitted that claim 1 defines allowable subject matter. Therefore, the use of multiple memory addressing techniques as described by Ishiwata, in combination with Fujita does not teach or suggest the invention of claims 3 and 39 which are dependent, either directly or indirectly, on claim 1. Similarly, the use of a control section as described by Ishiwata, in combination with Fujita does not teach or suggest the invention of claims 4 and 40 which are dependent, either directly or indirectly, on claim 1. Also, the use of an image processing apparatus and a control section as described by Ishiwata, in combination with Fujita does not teach or suggest the invention of claim 45 which is dependent, either directly or indirectly, on claim 1. Finally, the use of a control section and data selectors as described by Ishiwata, in combination with Fujita does not teach or suggest the invention of claim 45 which is dependent, either directly or indirectly, on claim 1.

Since claims 3, 4, 39, 40, 45, and 46 depend either directly or indirectly from claim 1, it is respectfully submitted that claims 3, 4, 39, 40, 45, and 46 define allowable subject matter as well. Applicants respectfully request that the rejection of claims 3, 4, 39, 40, 45, and 46 under 35 U.S.C. 103(a) be removed.

Further, in the current Office action, claims 5-10 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fujita, Ishawata, and further in view of Matsumoto et al. (U.S. Patent 5,666,544), hereinafter, Matsumoto.

Applicants respectfully traverse the foregoing rejections in view of the above pending claims and for reasons set forth hereafter.

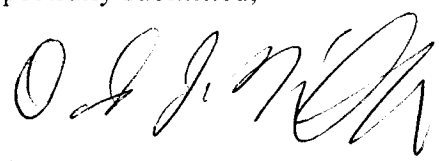
As described previously, Fujita does not teach or suggest the invention of independent claim 1 and it was submitted that claim 1 defines allowable subject matter. Therefore, the use of data handshaking methods as described by Matsumoto and multiple memory addressing

techniques as described by Ishiwata, in combination with Fujita, does not teach or suggest the invention of claims 5 and 41 which are dependent, either directly or indirectly, on claim 1. Similarly, the combination of Fujita, Ishiwata, and Matsumoto does not teach or suggest the invention of claims 6-10 which are dependent, either directly or indirectly, on claim 1.

Since claims 5-10 and 41 depend either directly or indirectly from claim 1, it is respectfully submitted that claims 5-10 and 41 define allowable subject matter as well. Applicants respectfully request that the rejection of claims 5-10 and 41 U.S.C. 103(a) be removed.

Accordingly, the applicant respectfully requests reconsideration of the rejections and objections based on at least the foregoing. After such reconsideration, it is urged that allowance of claims 1-10 and 39-46 will be in order.

Respectfully submitted,



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